



AstaCos[®]

Micro algae

Haematococcus pluvialis

Astaxanthin

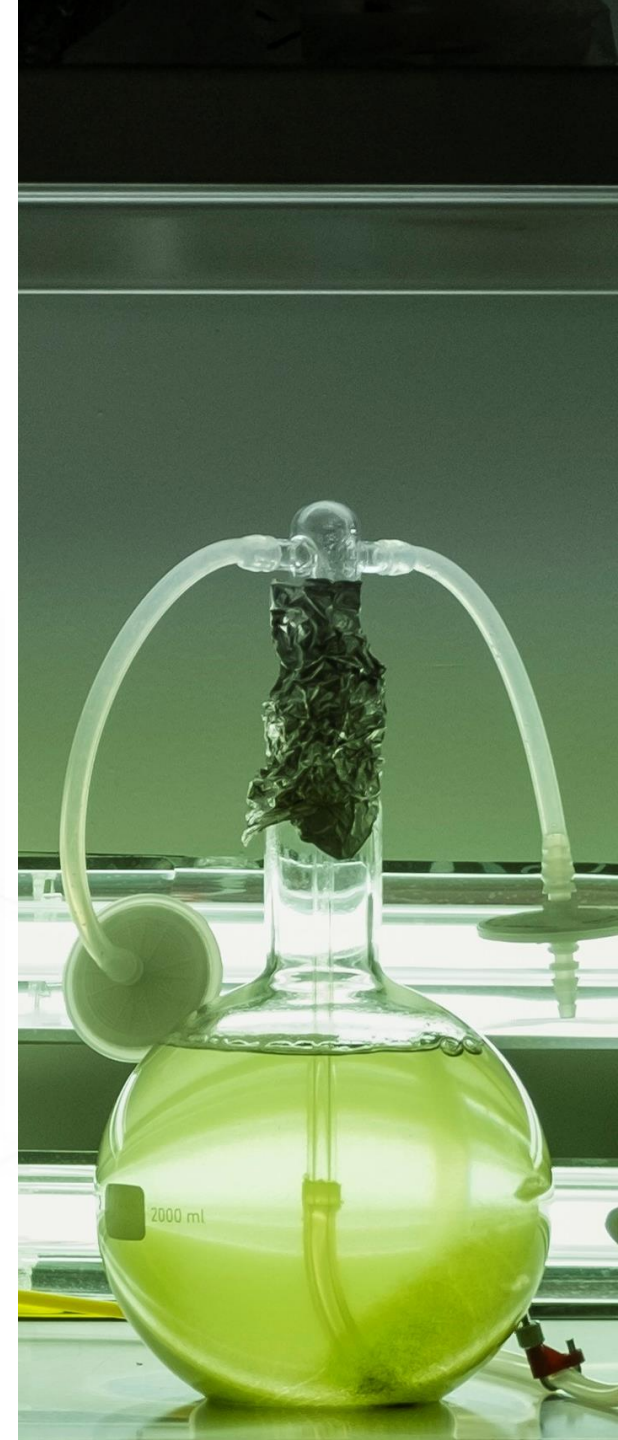
Effect and cultivation
of an extremolyte



Haematococcus pluvialis: our strain collection

>20 different *Haematococcus pluvialis* strains

>Only the best strains – different qualities



We guarantee 100% efficiency

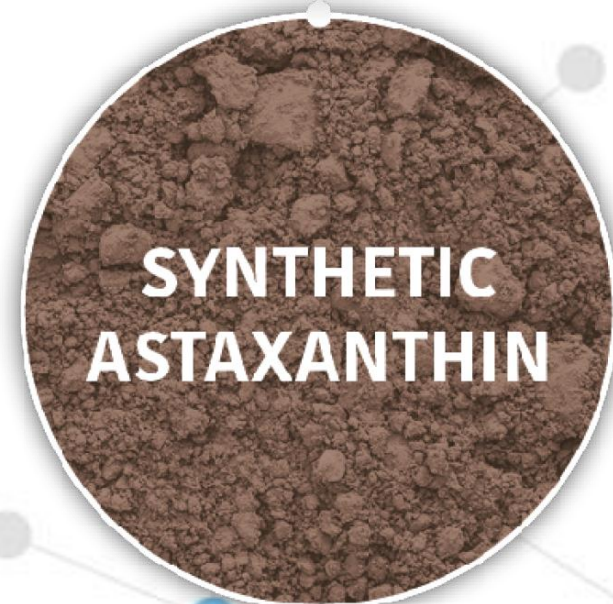
**Natural astaxanthin:
4x more effective
than synthetic astaxanthin**



**NATURAL
ASTAXANTHIN**



**3S, 3'S
HIGHLY EFFECTIVE**



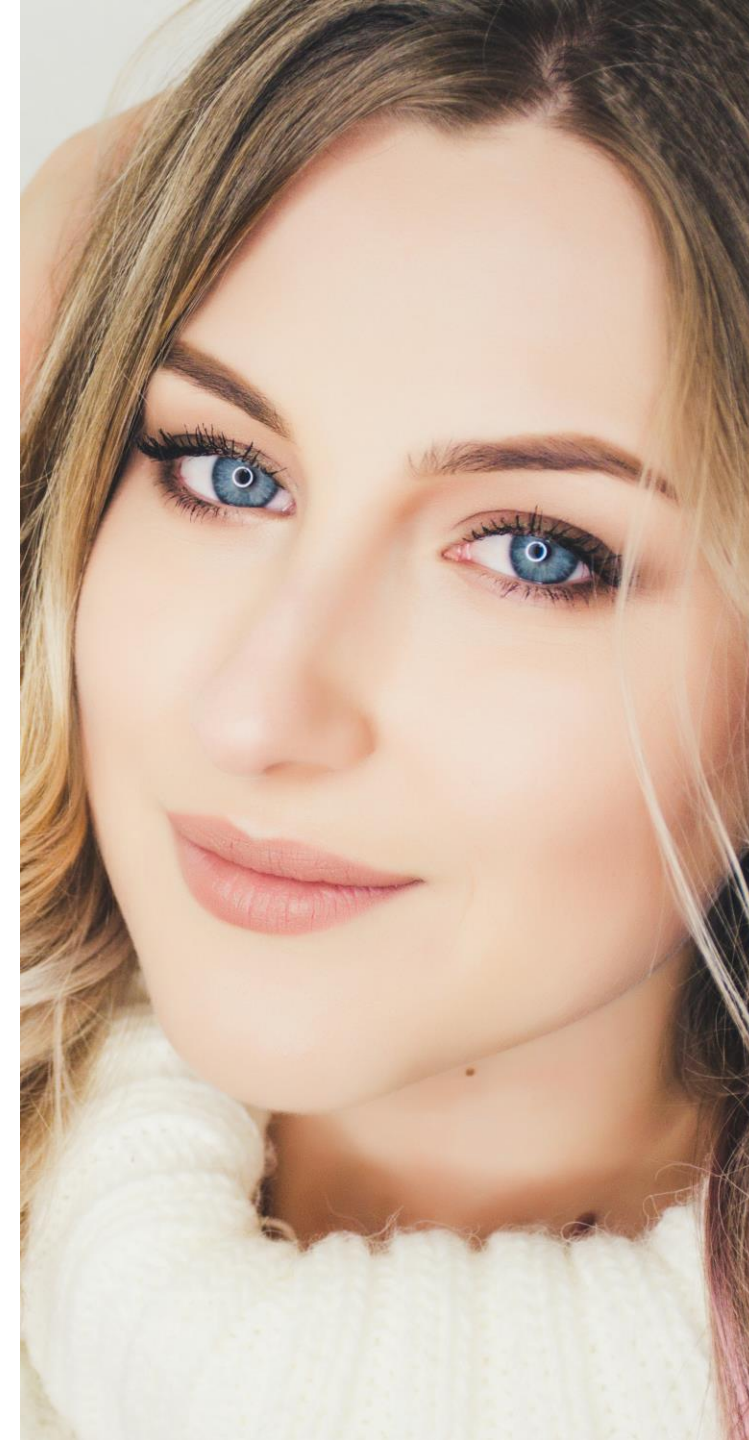
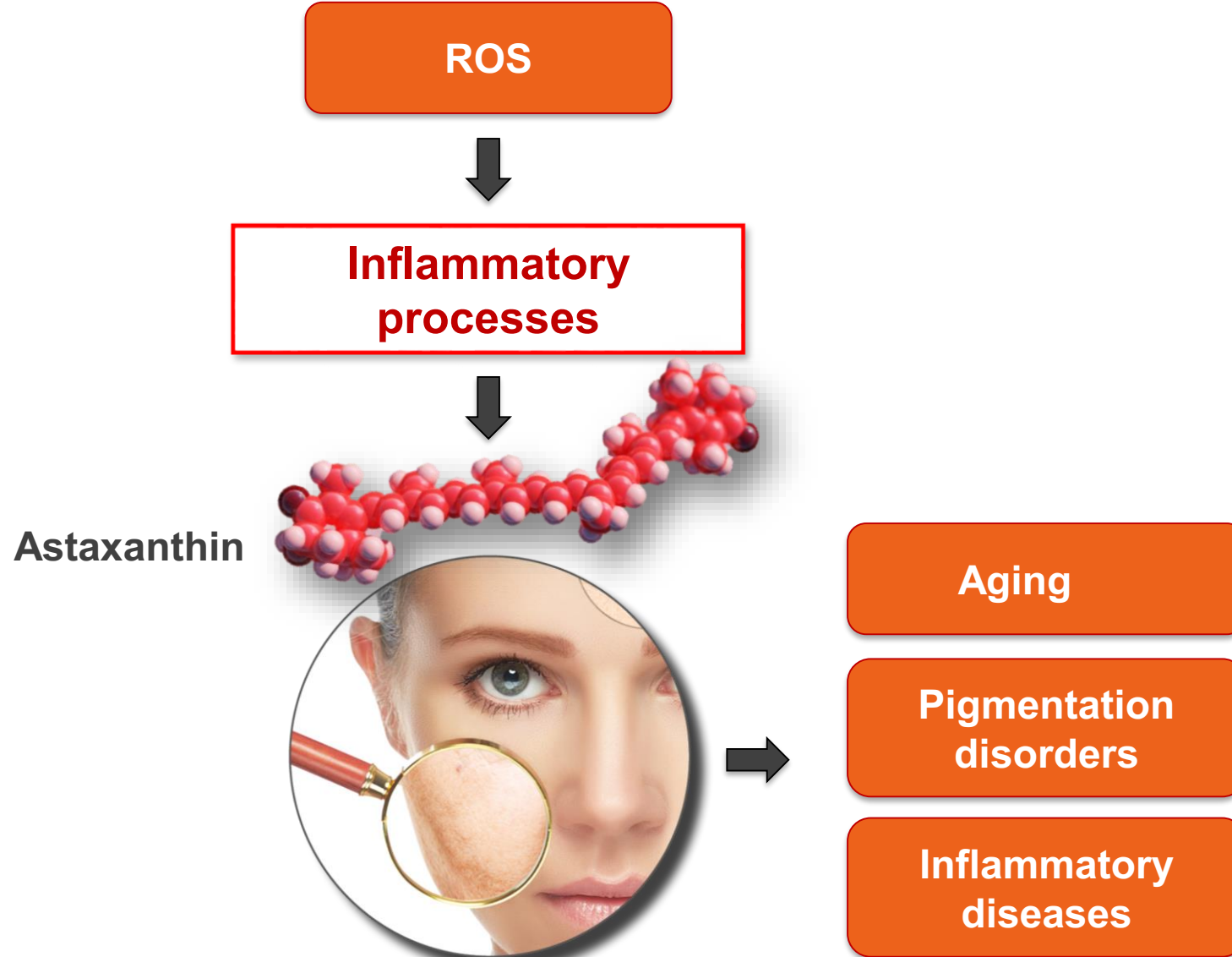
**SYNTHETIC
ASTAXANTHIN**



**3R, 3'R
HARDLY EFFECTIVE**

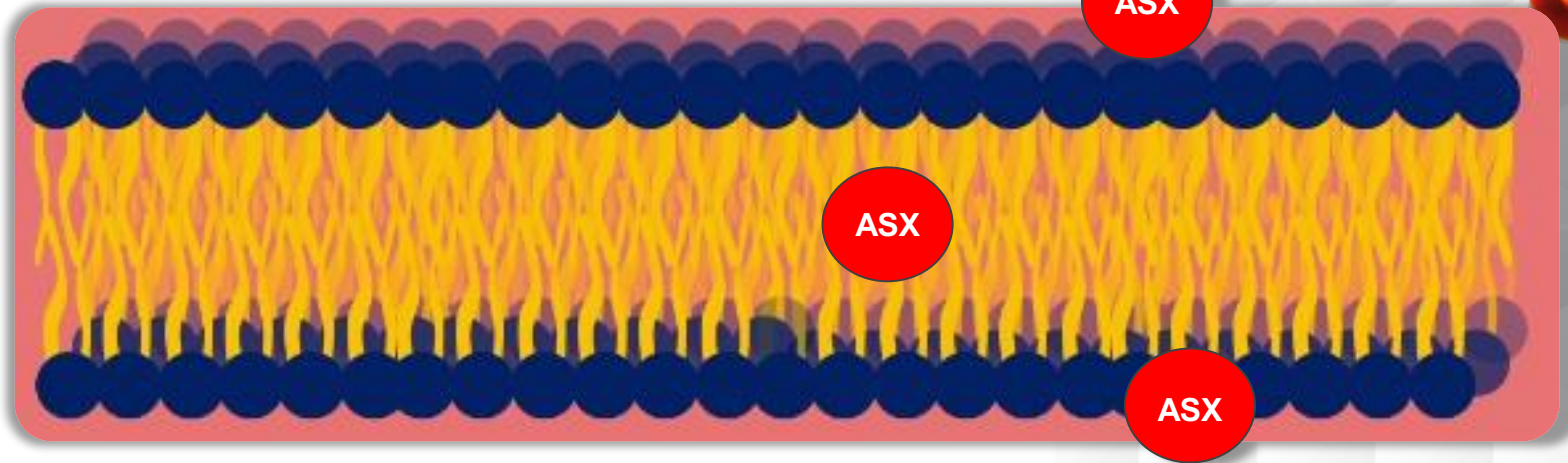
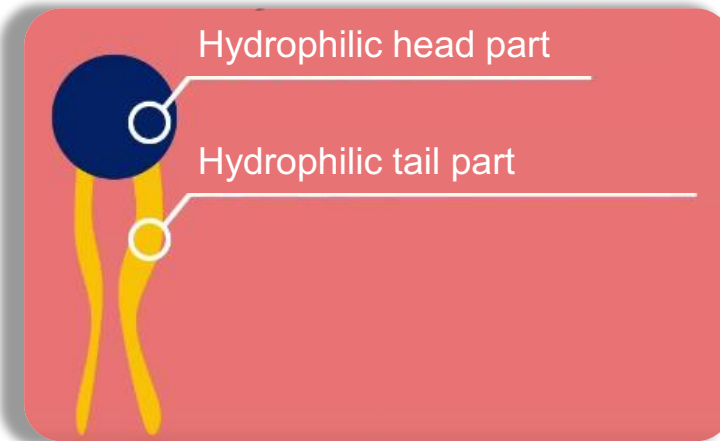
**3R, 3'S
HARDLY EFFECTIVE**

Oxidative stress and ROS



The special feature of natural astaxanthin

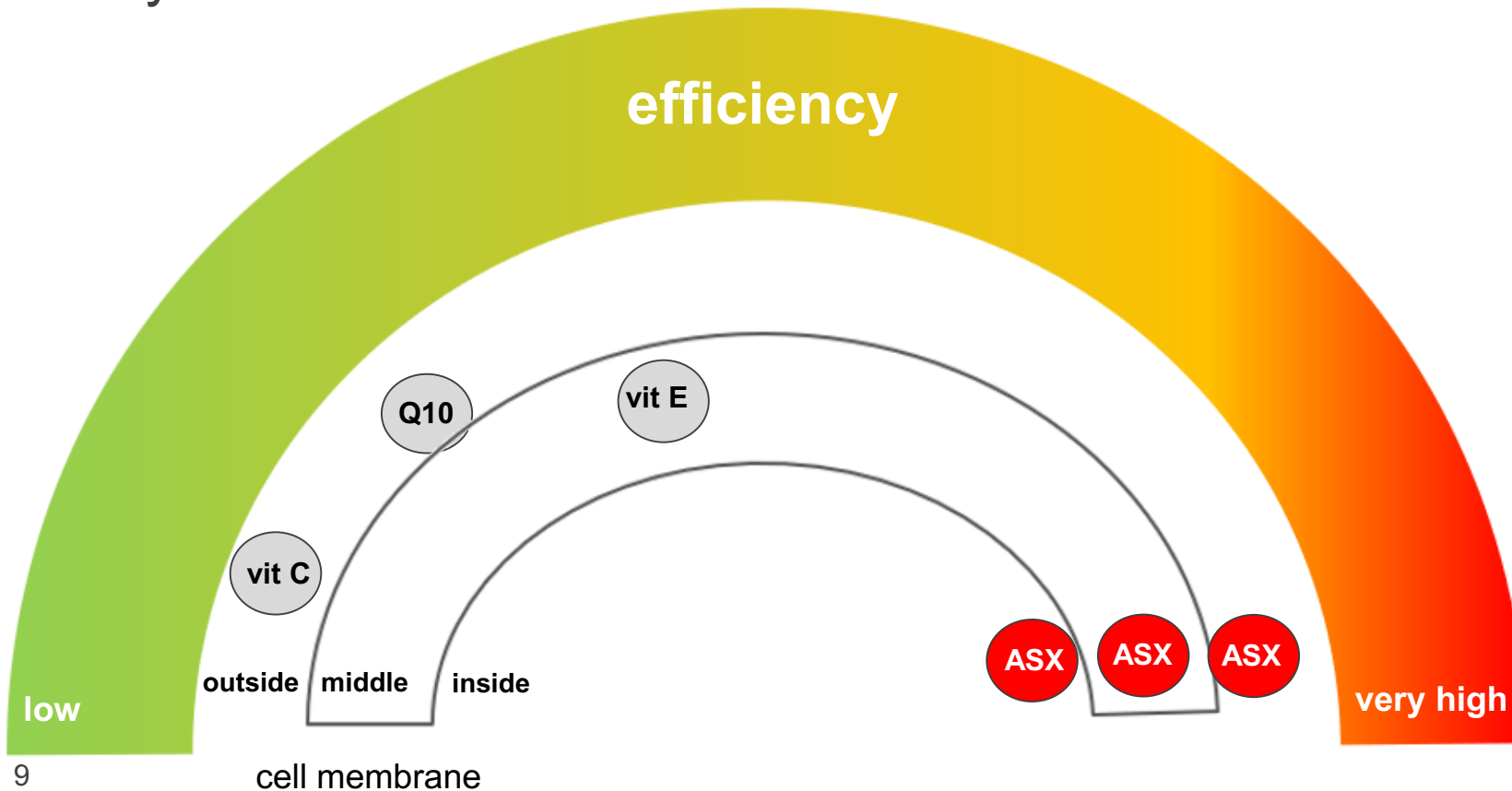
- Lipophilic and hydrophilic molecular chains
- Perfect incorporation into the cell membrane
- Membrane-permeable & fat-soluble



The diamond among free radical scavengers & antioxidants

Integral antioxidant protection of the cell membrane

→ Protection of the outer, inner and interstitial layers of the cell membrane

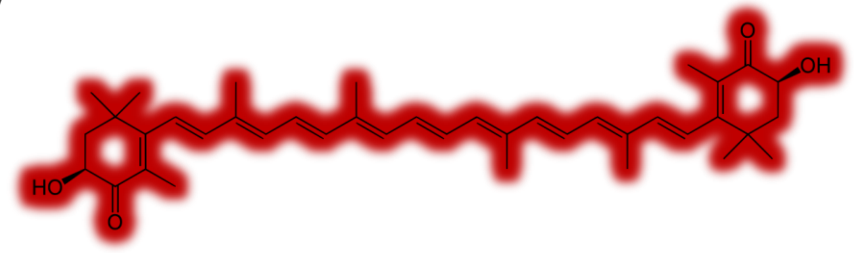


6,000x stronger than vit. C
770x stronger than Q10
100x stronger than vit. E

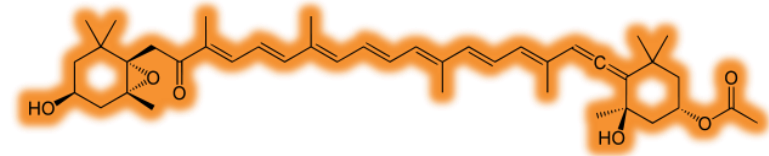


Antioxidative power of Astaxanthin

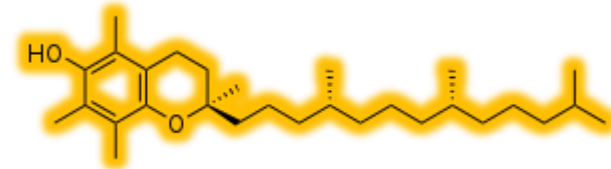
Astaxanthin – strongest antioxidant – no prooxidant activity



Fucoxanthin – 5.5x less antioxidative – prooxidative



α -Tocopherol – 100x less antioxidative – prooxidative



Our guarantee for your success

- The most powerful antioxidant
- 100% efficiency



AstaCos[®]

Hightech
beauty ingredient

AstaCos® OL50

- Algae-based oleoresin
- Astaxanthin content of 5%
- Homogenization with certified organic jojoba oil
- COSMOS CERTIFIED→
suitable for use in natural cosmetics
- 100% vegan
- Animal testing-free
- Production-optimized storage conditions: 8 to 20°C
(target: room temperature – up to 22°C)
- Storage stability: 24 months



AstaCos® OL50: Hard facts

INCI:

Simmondsia chinensis seed oil,
Haematococcus pluvialis
extract, Lecithin, Helianthus
annuus seed oil, Tocopherol

Claims:

Vegan and free from GMO DNA,
palm oil, cosmetic allergens,
CMR, nanoparticles

Formulations:

Oil soluble
Stable at temperatures
up to 80°C for max. 1h

Dosage in formulations:

AstaCos® OL50 –
0,01% to 0,3%



AstaCos®: frame formulations

Anti Aging:

- **asta2PHASE:** 2-phase oil
- **astaINTENSE-SERUM:**
new formulations coming soon
- **astaHAND:**
new formulations coming soon

Sun protection:

- **astaSUN:**
new formulations coming soon



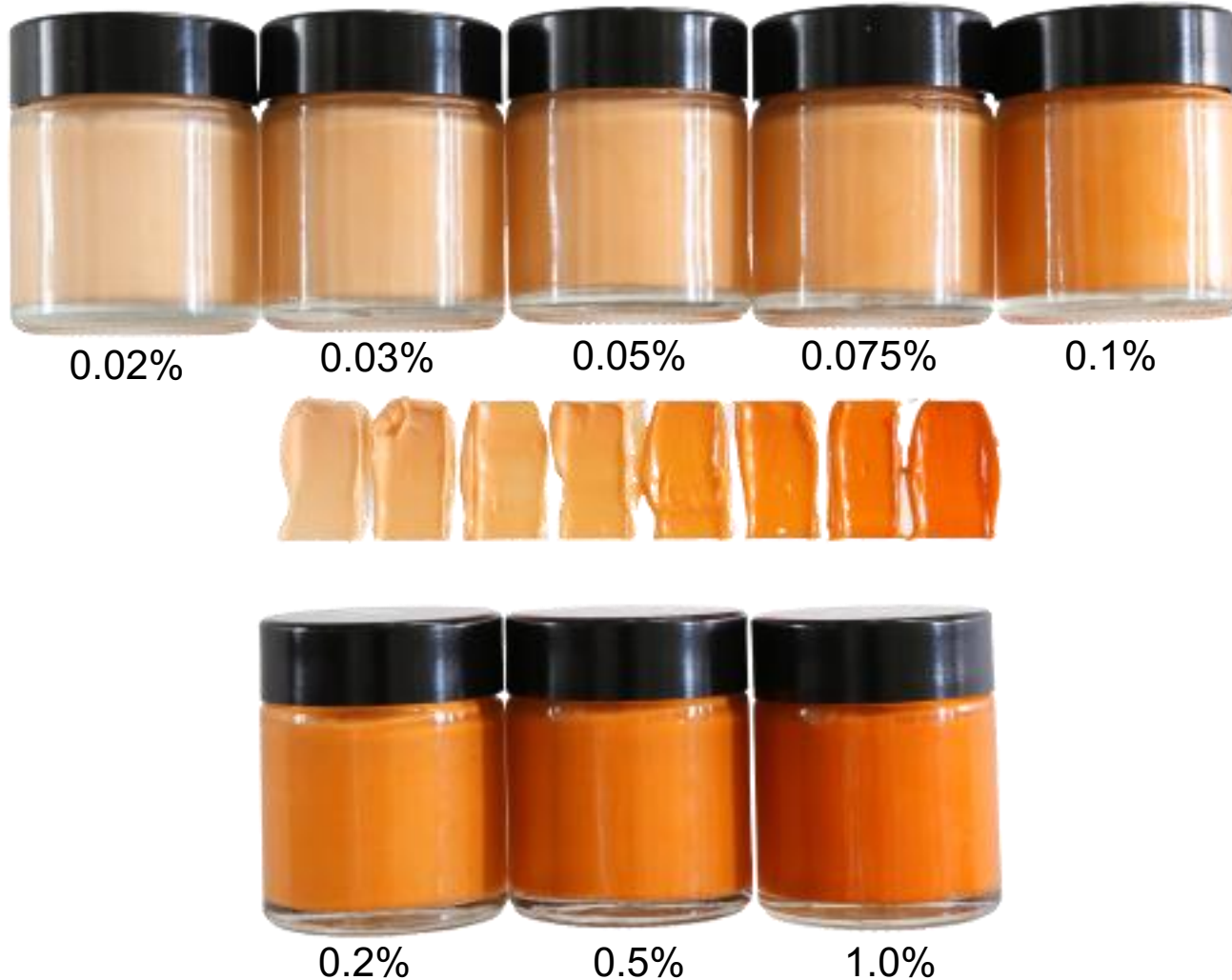
Color spectra AstaCos® OL50: O/W emulsion

Base cream with hydrophilic properties



Color spectra AstaCos® OL50: W/O emulsion

Base cream with lipophilic properties



Key benefits AstaCos[®]: to put it straight

- The most powerful antioxidant
- Highest safety, scientifically proven
- Verified effects
- Exclusive cosmetic products & frame formulations



Scientific results



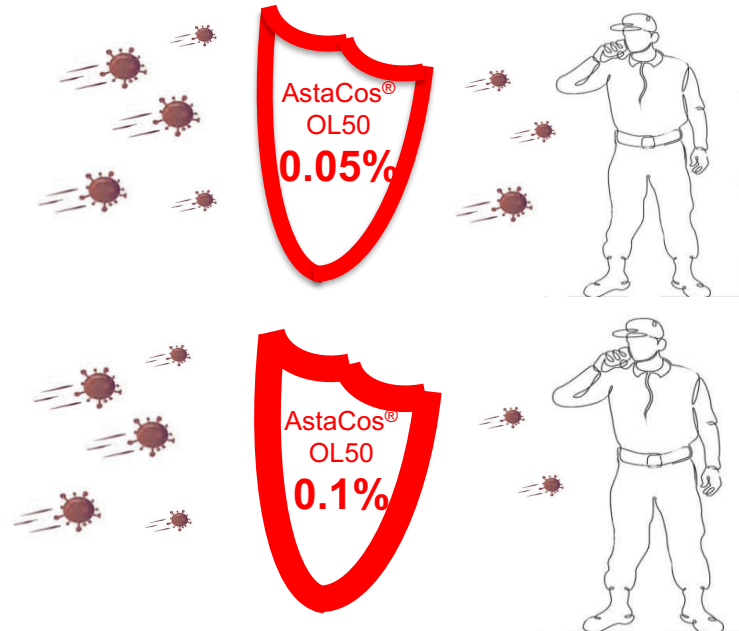
AstaCos[®]: claims

- Nearly 100% antioxidant efficacy
- Biological protection against UVB radiation
- Powerful against anti-aging
- Protection against digital aging

Result: antioxidant effectiveness

0.05% AstaCos® OL50 =
cell stress reduction by 87.52%

0.1% AstaCos® OL50 =
cell stress reduction by 92.93%



The test sample was able to strongly reduce oxidative stress in a dose-dependent manner!

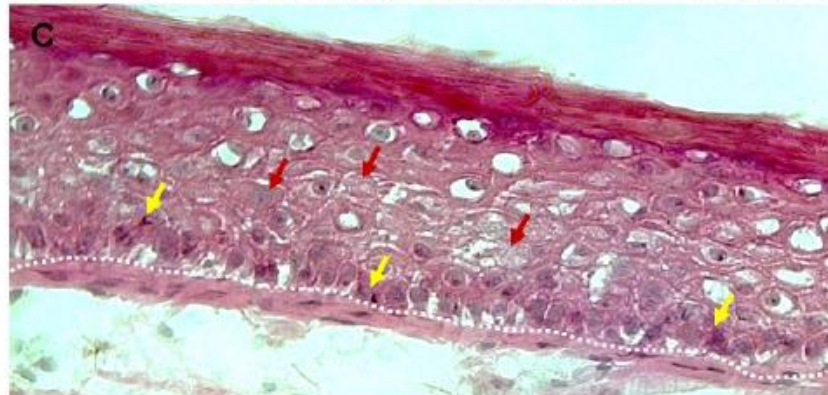
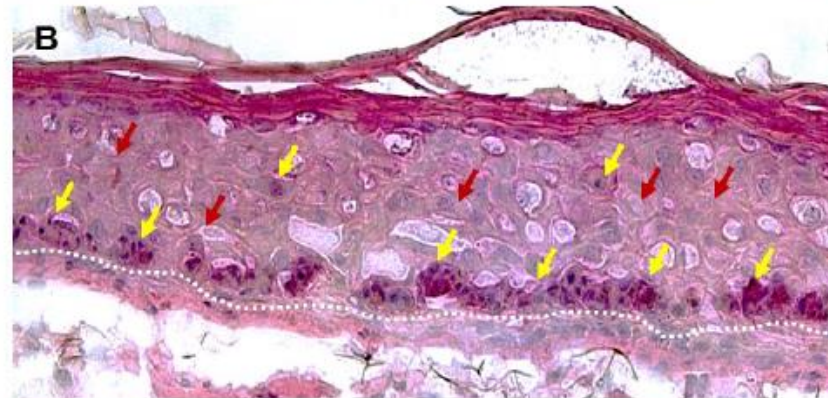
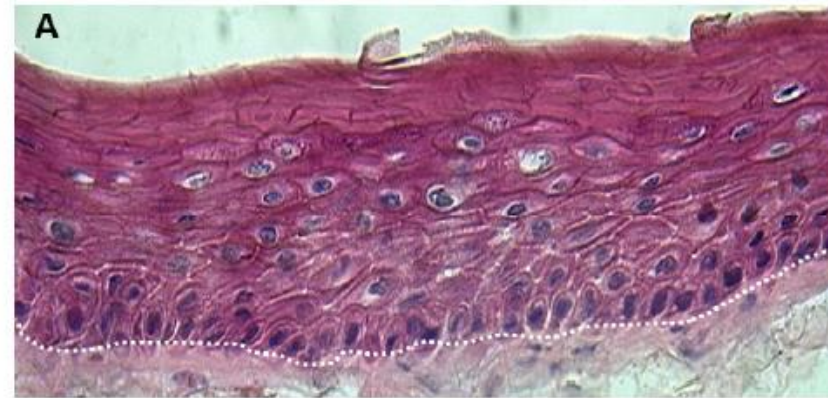


Result: protective effect against UVB rays

UVB-irradiated 3D skin models H&E staining after 24 hours

- A) untreated skin tissue, not irradiated (reference)
- B) untreated skin tissue irradiated with 200 mJ/cm² (positive control)
- C) skin tissue treated with 0.05% AstaCos[®] OL 50 after irradiation with 200 mJ/cm²

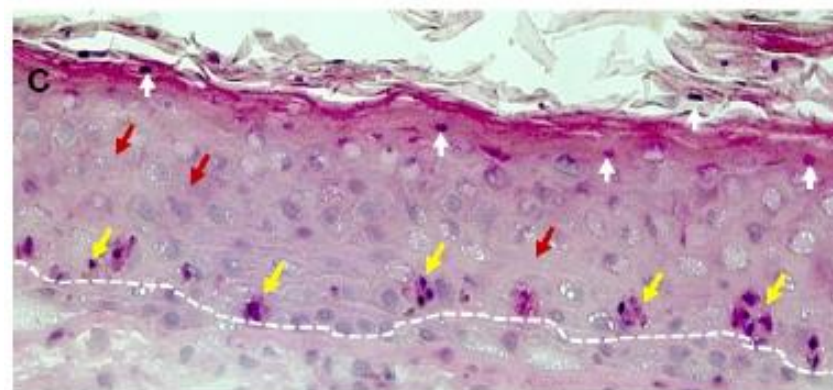
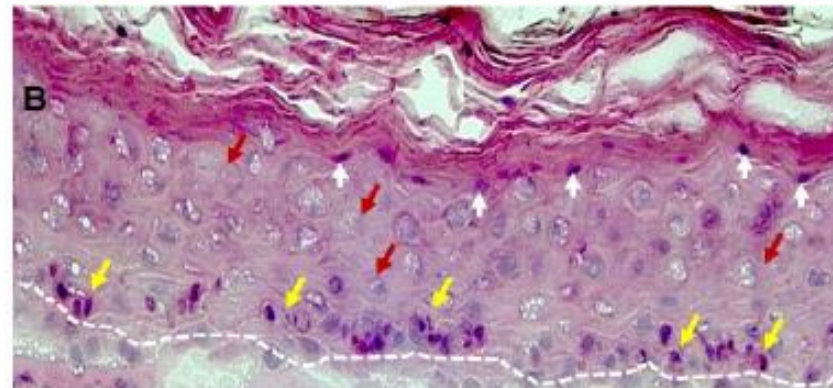
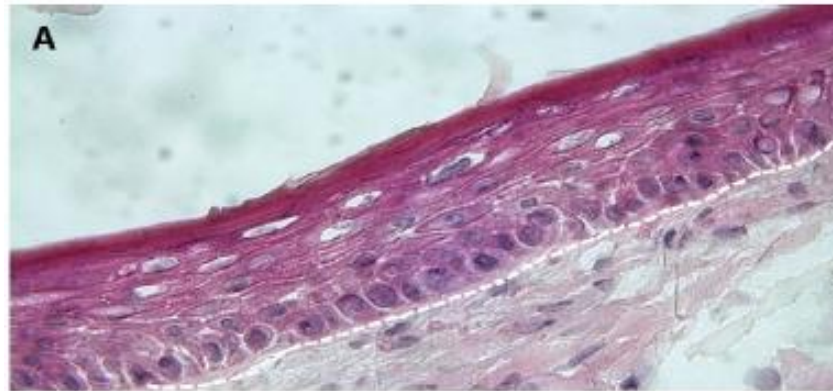
AstaCos[®] OL50 shows strong protective effect against UVB irradiation.



Result: regeneration after UVB irradiation

UVB irradiated 3D skin models H&E staining after 48 hours.

- A) untreated skin tissue, not irradiated (reference)
- B) untreated skin tissue irradiated with 200 mJ/cm² (positive control)
- C) skin tissue treated with 0.05% AstaCos[®] OL 50 after irradiation with 200 mJ/cm²



AstaCos[®] OL50 provides only low effects on skin damage caused by UVB irradiation.

Result: physiological and histological *in-vitro* testing

Antioxidant efficacy against UVB irradiation of skin cells

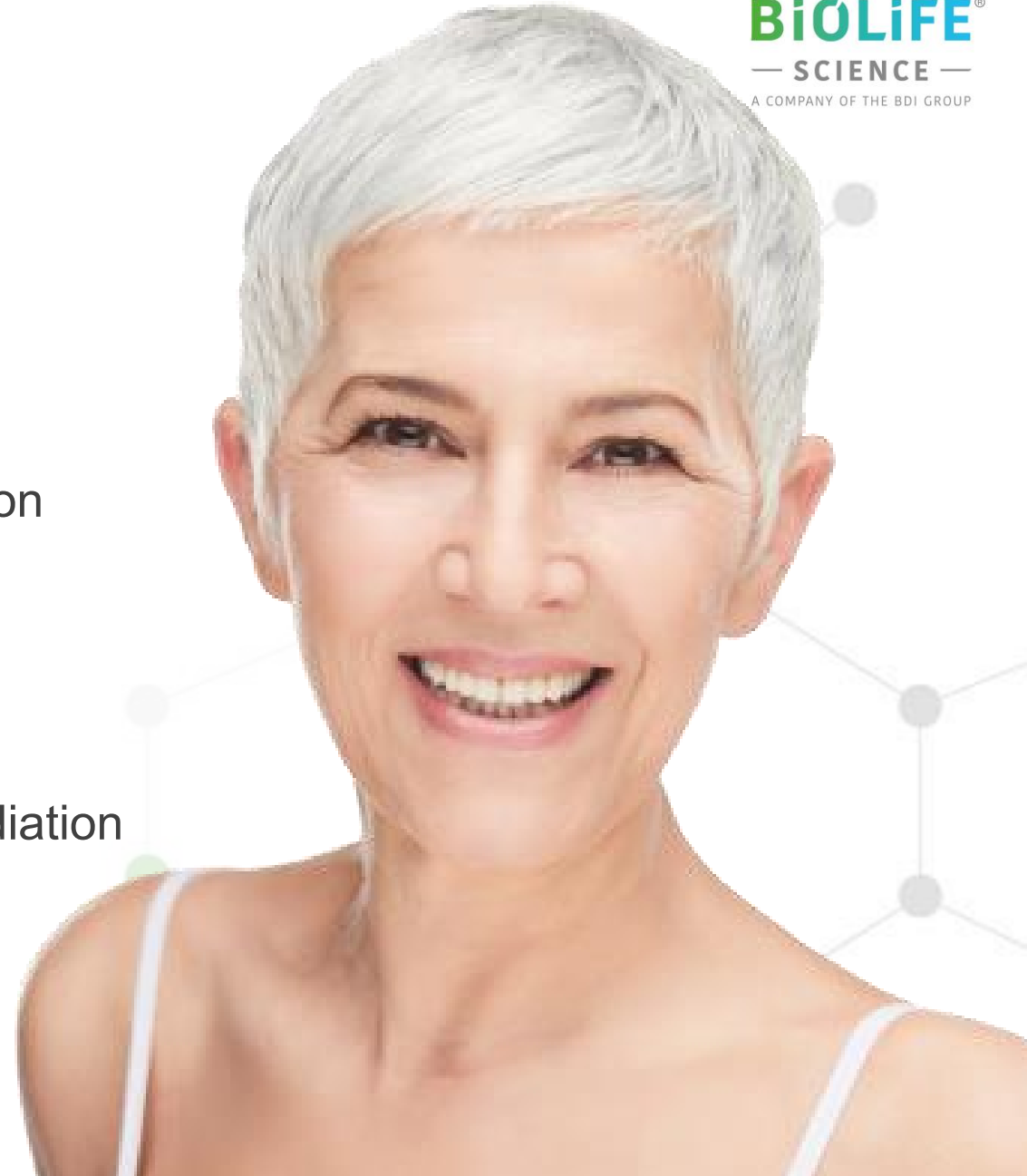
**Nearly 100% antioxidant efficacy
with the use of 0.1% AstaCos® OL50**

Protective effect of AstaCos® OL50 against UVB irradiation

**AstaCos® OL50 provides biological UV
protection for the cell – no SPF!**

Regenerative potential of AstaCos® OL50 after UVB irradiation

**AstaCos® OL50 as pre-treatment and
protection! → low regeneration effect**



Physiological and histological *in-vitro* testing: explanation

- *In-vitro* test of AstaCos[®] OL50 on human keratinocytes.
 - **UVB irradiation** at 200 mJ/cm² and induction of oxygen radicals (ROS) by H₂O₂ treatment
 - 12 keratinocyte models (12 Phenion[®] 3D-full thickness skin models)
 - Sample analysis after 24h and 48h
 - Product applications: 0.01%, 0.05% and 0.1% AstaCos[®] OL50
- Testing for
 - **Antioxidant efficacy** during UVB irradiation of skin cells
 - **Protective effect** of AstaCos[®] OL50 against UVB irradiation
 - **Regenerative potential** of AstaCos[®] OL50 after UVB irradiation

Result: *in-vitro* SPF test

Sample	SPF
PMMA sheet non-irradiated	1.0
PMMA sheet with sample without irradiation	1.41
PMMA sheet with samples and 30 irradiations	1.38

Astaxanthin
does not show any SPF *in vitro*
but provides high biological cell protection

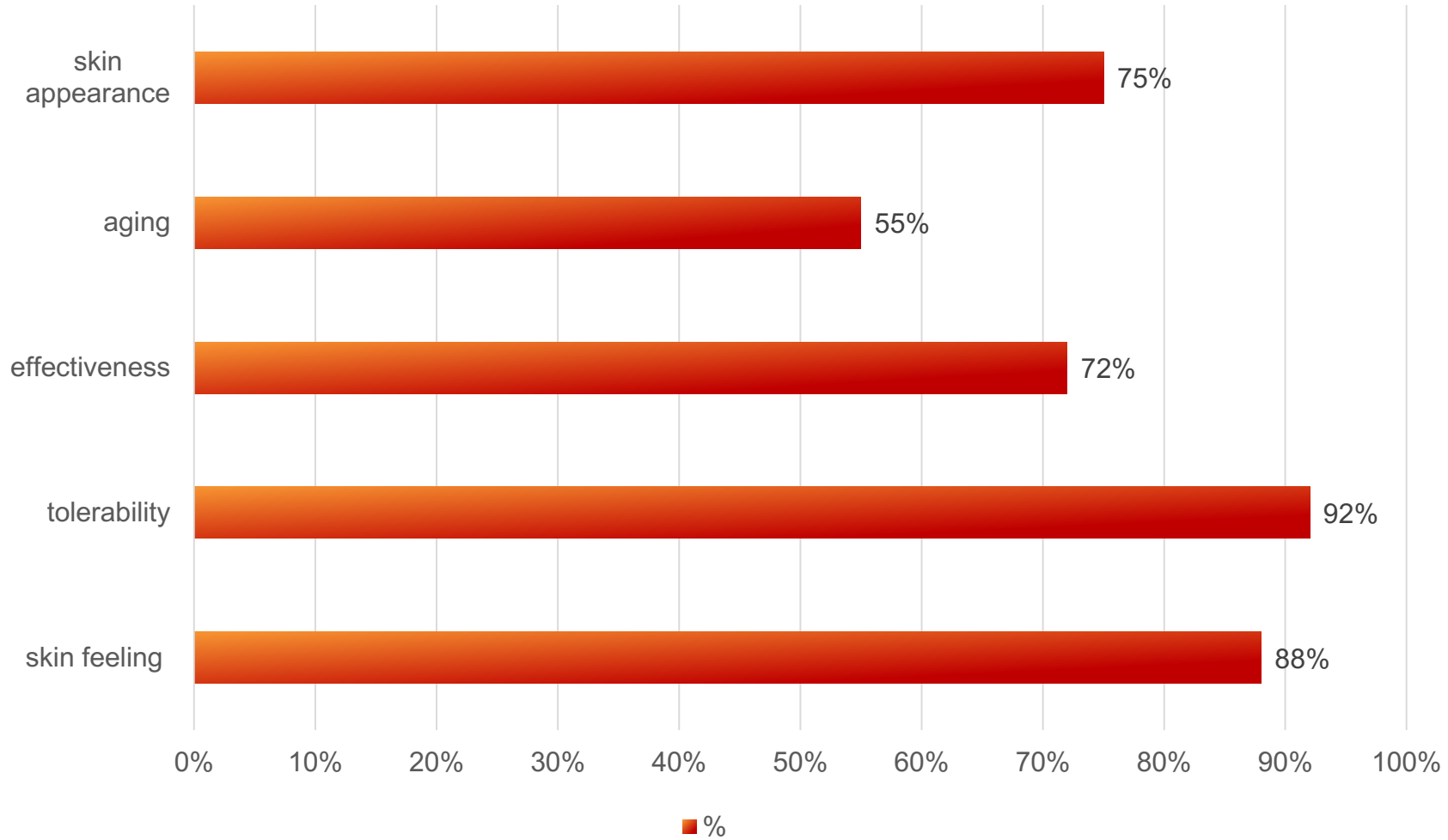


***In-vitro* SPF test: explanation**

- Experimental dermatological evaluation of the UVA radiation protection of a product according to the COLIPA test method for *in-vitro* UVA radiation determination.
- Measurement of the transmission of UV light through a thin film of the product on a microscope slide. The transmission is measured before and after irradiation with a specific dose of UV radiation.



Result: application and compatibility test



Result: application and compatibility test

Good efficacy confirmed and suitable for sensitive skin

**32 questions were asked about
application and effectiveness**

47% of which were rated excellent (1)

53% of which were rated very good (2)

70% find the color pleasant (2)

Rating 1-6 | 1 = excellent, 6 = not satisfying



Result: application and compatibility test

Good efficacy confirmed and suitable for sensitive skin

>80% of probands confirm – good moisturizing effect

>60% of probands confirm – skin feels tighter

60% of probands confirm – reduces pigmentation and age spots

>50% of probands confirm – reduces wrinkles and lines





Application and compatibility test: explanation

Test preparation: serum with 0.05% AstaCos[®] OL50, tested with regard to various parameters

- Efficacy
- Skin sensation
- Compatibility

Application of the home-use test

- 25 test persons (sensitive to atopic skin)
- 4 weeks, 1 test per daily
- Application as facial care

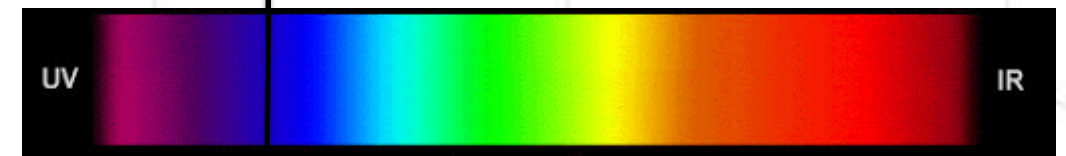
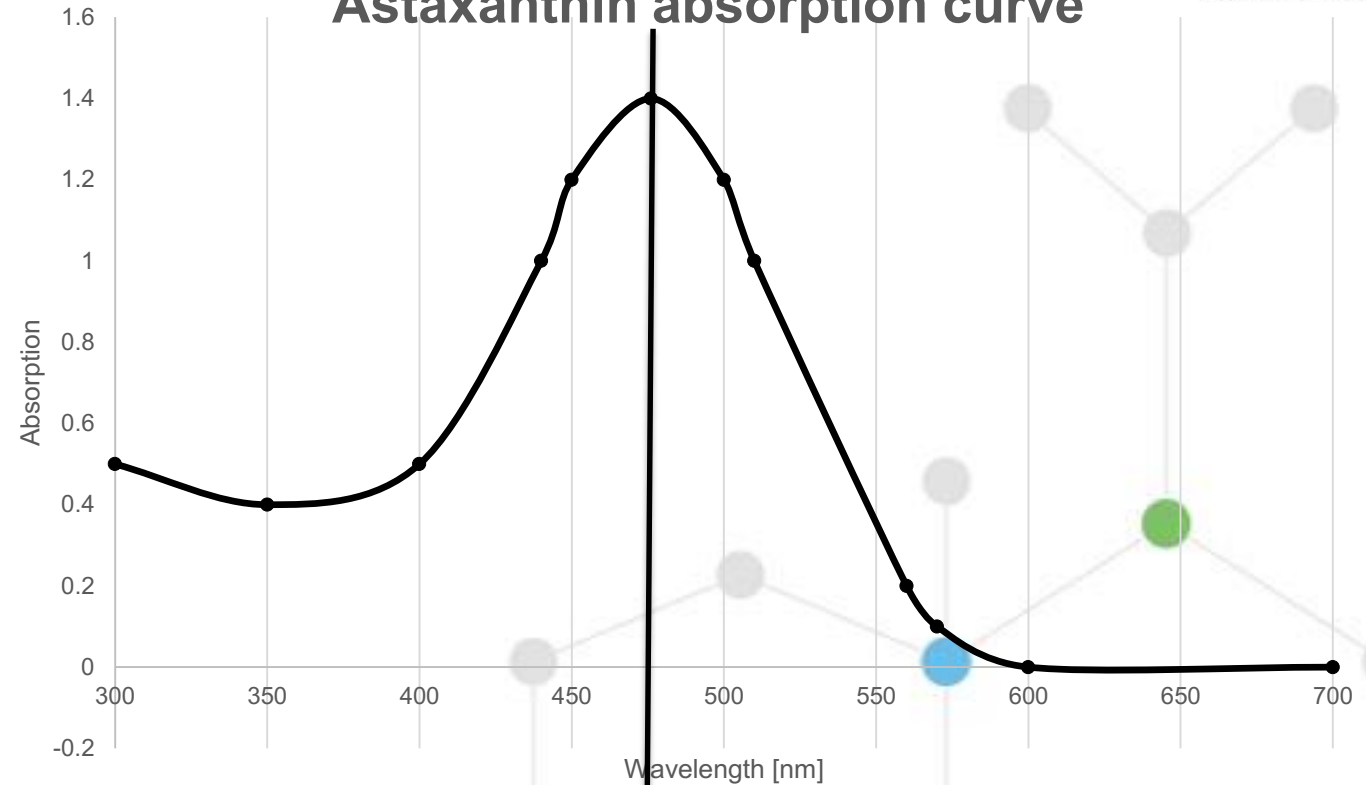


Blue light

- Absorption maximum of astaxanthin
→ 476nm
- Range of blue light

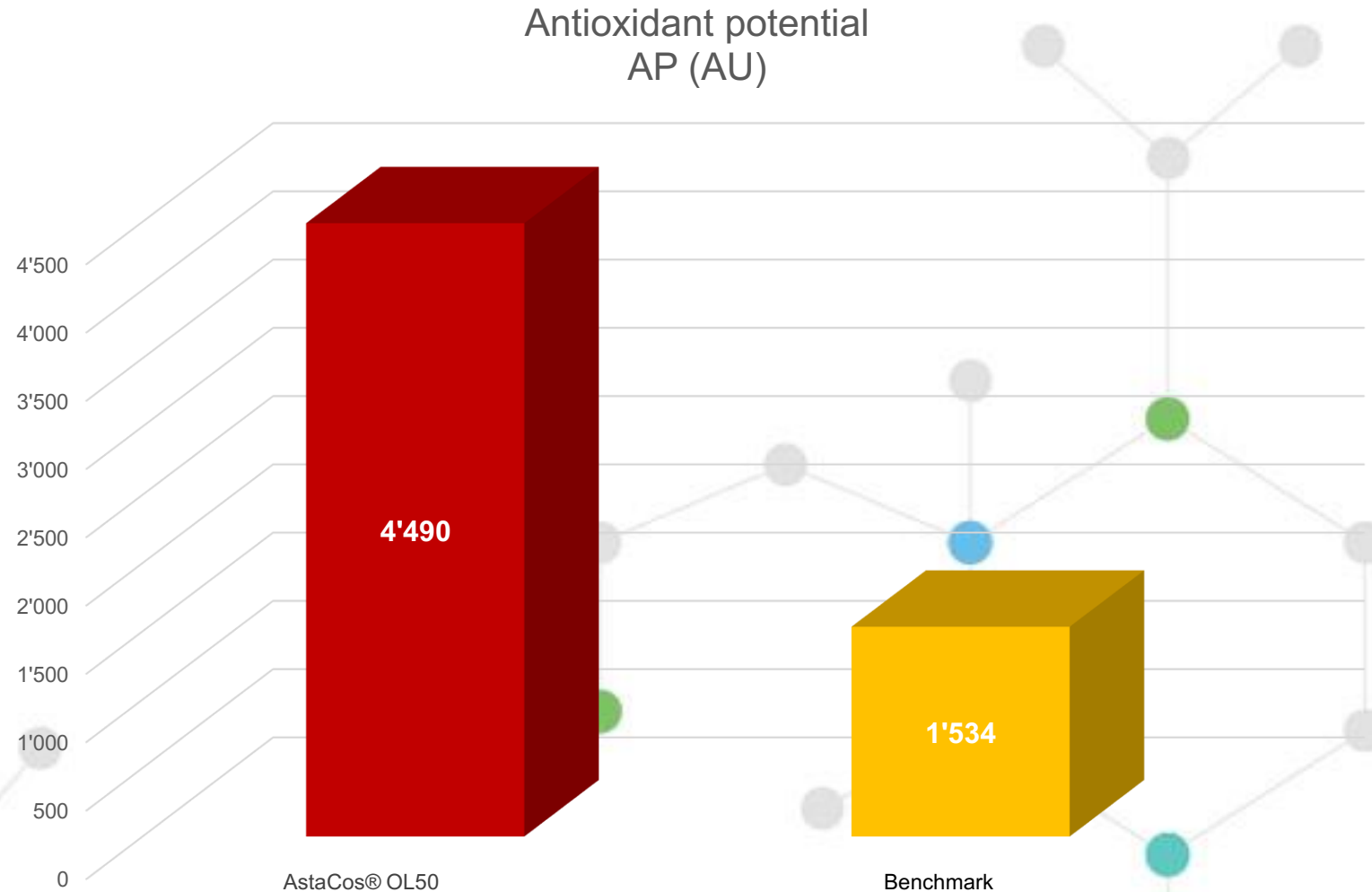
**AstaCos® OL50 protects
against digital ageing**

Astaxanthin absorption curve



Result: ESR spectroscopy

**AstaCos[®] OL50 shows a
2.9 times higher
antioxidant activity than a
comparable competitor
product.**



ESR spectroscopy: the antioxidant potential of AstaCos® OL50

Measurement of activity against stable test radicals –
DPPH (diphenyl-picryl-hydrazyl) with ESR spectroscopy

AP method:

- a standardized analytical method with benchmark results
- a meaningful comparison of active ingredients in terms of their ability to scavenge free radicals and/or terminate radical chain reactions
- a framework to control variation within or between products and provide quality standards that are evaluated for quality control and efficacy claims

Result: patch test → *in vivo*

No skin irritations after 72h of extensive application with 0.05% & 0.5% AstaCos® OL50.

No sensitization for allergic individuals.

Safe application as a skin serum.



Patch test: explanation

The patch test is used to detect primary skin irritation or contact allergy with a substance under investigation.

Testing with atopic and skin-sensitive persons

- 50 test individuals (of which 27 were atopics and 23 skin-sensitive individuals)
- Age: 18 to 72 years

Test product: serum with 0.05% AstaCos® OL50 and 0.5% AstaCos® OL50

- Test concentration: undiluted
- Test period: 48 to 72 hours



**AstaCos[®] OL50
does not cause any
skin irritation!**

**REACH
COMPLIANT**

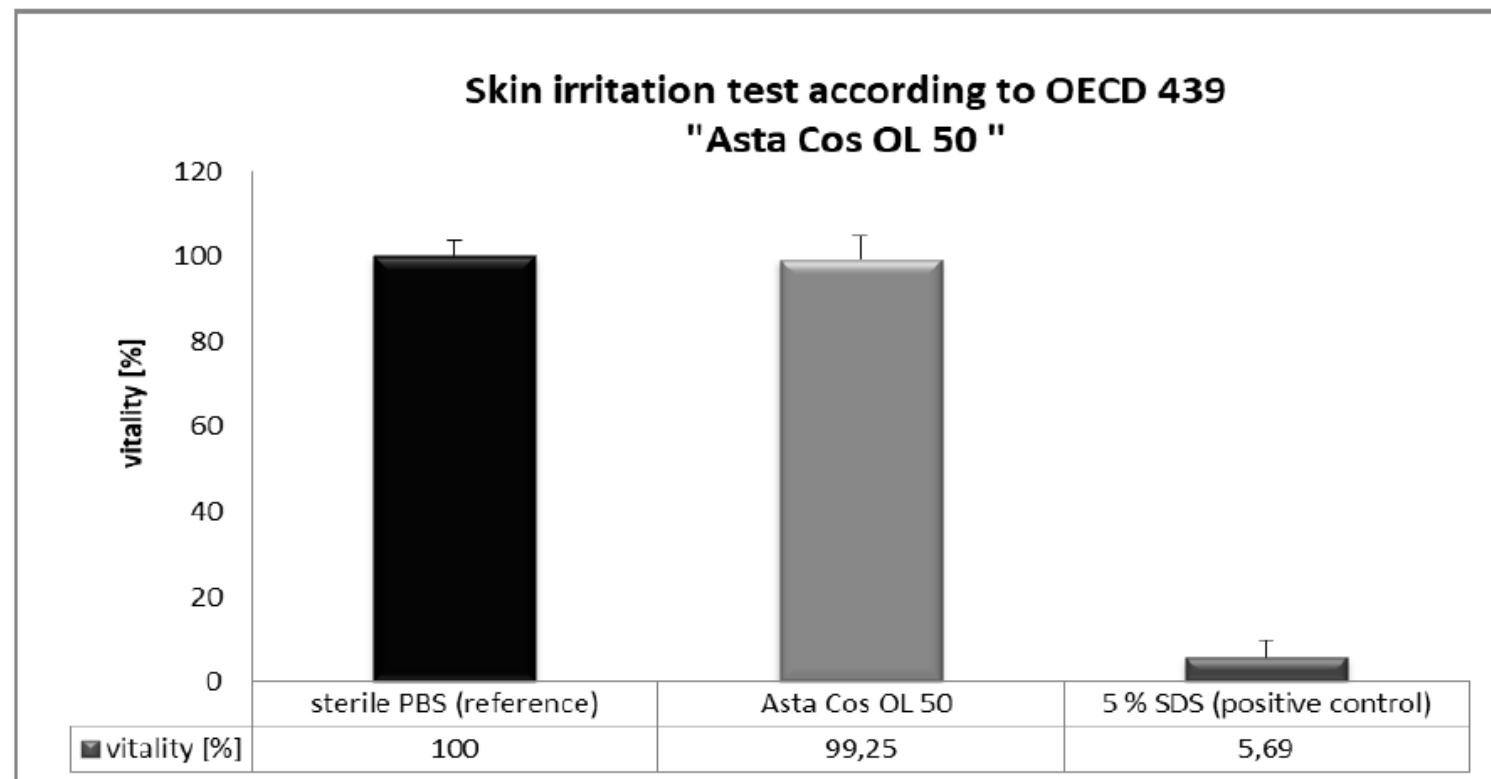


Figure: summary plot of MTT viability test results after one-hour topical incubation and 42 hours post-incubation

OECD TG 439: explanation

- Provides information on the skin irritation potential of an ingredient or formulation → important component of any safety assessment
- After applying the test product, the vitality of EpiDermTM 3D epidermis models is analyzed by MTT assay
 - 30μL AstaCos[®] OL50 are applied topically – incubation for 1h – post incubation for 42h
 - Negative control: PBS (phosphate-buffered saline)
 - Positive control: 5% aqueous sodium lauryl sulfate



BDI-BioLife Science

Your specialist for the development
and production of innovative,
high-quality algae ingredients.

Custom-built: the hightech production plant

- Self-developed technology – from planning to production
- Unique and one-of-a-kind set-up in the algae cultivation industry
- Production of the highest quality
- COSMOS CERTIFIED, Halal, Kosher, ISO 9001:2018

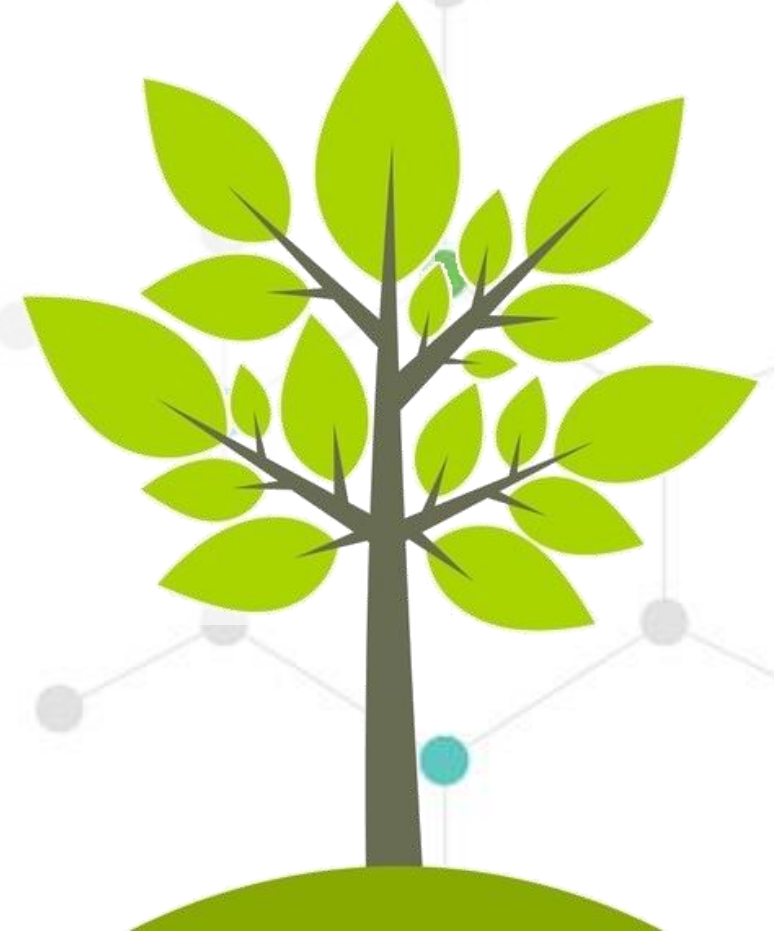


**COSMOS
CERTIFIED**



Sustainability

- 100% green electricity
- 100% biogenic carbon dioxide (CO₂)
- Gentle extraction of secondary plant compounds (lipids & astaxanthin)





Our guarantee for your success

- Non-seasonal production – 365 days
- Highest product quality
- Highest hygiene standards
- Sustainable & green